



FCC CFR47 PART 22 SUBPART H / IC RSS-132 ISSUE 3
FCC CFR47 PART 24 SUBPART E / IC RSS-133 ISSUE 6
FCC CFR47 PART 27 SUBPART F & H / IC RSS-130 ISSUE 1
FCC CFR47 PART 27 SUBPART L / IC RSS-139 ISSUE 3
FCC CFR47 PART 90 SUBPART S

WWAN

CERTIFICATION TEST REPORT

FOR

WCDMA/LTE Wrist device + BT/BLE and DTS b/g/n

MODEL NUMBER : SM-R805U, R805W

FCC ID: A3LSMR805U

IC: 649E-SMR805W

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Prepared for
SAMSUNG ELECTRONICS CO., LTD.
129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI,
GYEONGGI-DO, 16677, KOREA

Prepared by
UL Korea, Ltd.
26th floor, 152, Teheran-ro, Gangnam-gu Seoul, 06236, Korea
Suwon Test Site: UL Korea, Ltd. Suwon Laboratory
218 Maeyeong-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16675, Korea
TEL: (031) 337-9902
FAX: (031) 213-5433



ACCREDITED*

Testing
Laboratory

TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	06/19/18	Initial issue	Hoonpyo Lee
V2	07/14/18	Updated ERP/EIRP results	Hoonpyo Lee
V3	07/16/18	Updated ERP/EIRP results	Hoonpyo Lee

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.

EUT DESCRIPTION: WCDMA/LTE Wrist device + BT/BLE and DTS b/g/n

MODEL NUMBER: SM-R805U, SM-R805W

SERIAL NUMBER: R3AK5009A4D, R3AK50098RT, R3AK5009A8H, R3AK5009CQN,
R3AK50098DB, R3AK5009MQW (RADIATED);
R3AK4002ZYZ (CONDUCTED);

DATE TESTED: MAY 28, 2018 – JUL 14, 2018

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 22H, 24E, 27F, 27H, 27L and 90S	Pass
INDUSTRY CANADA RSS-130, 132, 133, 139	Pass
INDUSTRY CANADA RSS-GEN	Pass

UL Korea, Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Korea, Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Korea, Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Korea, Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by IAS, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Korea, Ltd. By:



SungGil Park
Suwon Lab Engineer
UL Korea, Ltd.

Tested By:



Hoonpyo Lee
Suwon Lab Engineer
UL Korea, Ltd.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with following methods.

1. FCC CFR 47 Part 2.
2. FCC CFR 47 Part 22.
3. FCC CFR 47 Part 24.
4. FCC CFR 47 Part 27.
5. FCC CFR 47 Part 90.
6. IC RSS-130 Issue 1
7. IC RSS-132 Issue 3
8. IC RSS-133 Issue 6
9. IC RSS-139 Issue 3
10. IC RSS-GEN Issue 5
11. ANSI TIA-603-E, 2016
12. KDB 971168 D01 Power Meas License Digital Systems v03r01

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea. Line conducted emissions are measured only at the 218 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

218 Maeyeong-ro	
☒	Chamber 1
☒	Chamber 2
☒	Chamber 3

UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at <http://www.iasonline.org/PDF/TL/TL-637.pdf>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\text{EIRP} = \text{PSA reading with EUT worst orientation (dBm)} + \text{Path loss (dB)} - \text{cable loss (between the SG and substitution antenna)} + \text{Substitution Antenna Factor (dBi)}$$

$$\text{ERP} = \text{PSA reading with EUT worst orientation (dBm)} + \text{Path loss (dB)} - \text{cable loss (between the SG and substitution antenna)}$$

(Path loss = Signal generator output – PSA reading with substitution antenna)

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	2.32 dB
Radiated Disturbance, Below 1GHz	3.86 dB
Radiated Disturbance, Above 1 GHz	5.97 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a WCDMA/LTE Wrist device + BT/BLE and DTS b/g/n.
This test report addresses the WWAN operational mode.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum average radiated ERP / EIRP output powers as follows:

WCDMA

FCC Part 22/24 & RSS-132/133				
Band	Frequency Range	Modulation	Radiated	
	[MHz]		Avg [dBm]	Avg [mW]
Band 5	824~849	REL99	9.68	9.29
		HSDPA	8.98	7.91
Band 4	1710~1755	REL99	18.64	73.11
		HSDPA	17.96	62.52
Band 2	1850~1910	REL99	14.92	31.05
		HSDPA	14.89	30.83

Note: These data of Band 5 are ERP results.

(The EIRP conversion formula for IC : EIRP result (dBm) = ERP result (dBm) + 2.15 dB)

LTE Band 12

FCC Part 27 & RSS-130					
Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation	Radiated	
				Avg [dBm]	Avg [mW]
Band 12	699 ~ 716	10	QPSK	5.59	3.62
			16QAM	4.24	2.65
		5	QPSK	5.42	3.48
			16QAM	3.84	2.42
		3	QPSK	5.81	3.81
			16QAM	4.44	2.78
		1.4	QPSK	5.48	3.53
			16QAM	5.61	3.64

Note: These data are ERP results.

(The EIRP conversion formula for IC : EIRP result (dBm) = ERP result (dBm) + 2.15 dB)

LTE Band 13

FCC Part 27 & RSS-130					
Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation Peak	Radiated	
				Avg [dBm]	Avg [mW]
Band 13	777 ~ 787	10	QPSK	10.06	10.14
			16QAM	8.58	7.21
		5	QPSK	10.27	10.64
			16QAM	8.98	7.91

Note: These data are ERP results.

(The EIRP conversion formula for IC : EIRP result (dBm) = ERP result (dBm) + 2.15 dB)

LTE Band 25

FCC Part 24 & RSS-133					
Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation Peak	Radiated	
				Avg [dBm]	Avg [mW]
Band 25	1850 ~ 1915	20	QPSK	15.31	33.96
			16QAM	13.99	25.06
		15	QPSK	15.29	33.81
			16QAM	13.64	23.12
		10	QPSK	15.43	34.91
			16QAM	14.31	26.98
		5	QPSK	14.76	29.92
			16QAM	13.53	22.54
		3	QPSK	15.98	39.63
			16QAM	14.51	28.25
		1.4	QPSK	15.61	36.39
			16QAM	14.41	27.61

LTE Band 2

LTE Band 2 (Frequency range: 1850-1910 MHz) is covered by LTE Band 25 (Frequency range: 1850-1915 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 26 (Part90)

Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation Peak	Radiated	
				Avg [dBm]	Avg [mW]
Band 26	814 ~ 824	15	QPSK	8.60	7.24
			16QAM	7.83	6.07
		10	QPSK	8.44	6.98
			16QAM	7.27	5.33
		5	QPSK	8.40	6.92
			16QAM	8.57	7.19
		3	QPSK	8.22	6.64
			16QAM	7.14	5.18
		1.4	QPSK	8.55	7.16
			16QAM	7.30	5.37

* This band is only supported in the USA.

LTE Band 26 (Part22 & RSS-132)

Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation Peak	Radiated	
				Avg [dBm]	Avg [mW]
Band 26	824 ~ 849	15	QPSK	8.74	7.48
			16QAM	7.94	6.22
		10	QPSK	8.95	7.85
			16QAM	7.83	6.07
		5	QPSK	8.84	7.66
			16QAM	7.57	5.71
		3	QPSK	8.59	7.23
			16QAM	7.45	5.56
		1.4	QPSK	9.07	8.07
			16QAM	7.39	5.48

Note: These data are ERP results.

(The EIRP conversion formula for IC : EIRP result (dBm) = ERP result (dBm) + 2.15 dB)

LTE Band 5

LTE Band 5 (Frequency range: 824-849 MHz) is covered by LTE Band 26 (Frequency range: 814-849 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 66

FCC Part 27 & RSS-139					
Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation Peak	Radiated	
				Avg [dBm]	Avg [mW]
Band 66	1710 ~ 1780	20	QPSK	17.29	53.58
			16QAM	17.29	53.58
		15	QPSK	17.45	55.59
			16QAM	16.44	44.06
		10	QPSK	17.71	59.02
			16QAM	16.40	43.65
		5	QPSK	17.71	59.02
			16QAM	16.69	46.67
		3	QPSK	17.82	60.53
			16QAM	16.85	48.42
		1.4	QPSK	18.53	71.29
			16QAM	17.73	59.29

LTE Band 4

LTE Band 4 (Frequency range: 1710-1755 MHz) is covered by LTE Band 66 (Frequency range: 1710-1780 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a front metal antenna for the [List the bands supported] with a maximum peak gain as follow:

Frequency (MHz)	Peak Gain (dBi)
WCDMA Band 2 / LTE Band 2 / LTE Band 25 1850 ~ 1910 MHz	-3.19
WCDMA Band 5 / LTE Band 5 / LTE Band 26 814 ~ 849 MHz	-6.65
LTE Band 12 699 ~ 716 MHz	-10.20
LTE Band 13 777 ~ 787 MHz	-7.00
WCDMA Band 4 / LTE Band 4 / LTE Band 66 1710 ~ 1780 MHz	-3.66

5.4. WORST-CASE ORIENTATION

For WCDMA Band 2 / LTE Band 2 / LTE Band 25, the fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z it was determined that Y orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Y orientation. For erp/eirp tests, these bands were performed without wireless charger for evaluation of worst case mode.

For WCDMA Band 5 / LTE Band 5 / LTE Band 12 / LTE Band 13 / LTE Band 26, the fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z it was determined that Z orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Z orientation.

For erp/eirp tests, these bands were performed connected with wireless charger for evaluation of worst case mode.

For WCDMA Band 4 / LTE Band 4 / LTE Band 66, the fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z it was determined that X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation. For erp/eirp tests, these bands were performed without wireless charger for evaluation of worst case mode.

Note : All radiated spurious tests were performed connected with wireless charger for evaluation of worst case mode.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Adapter	SAMSUNG	ETA0U60JBE	RT2H613AS/7- E	N/A
Wireless Charger	SAMSUNG	EP-YO805	N/A	A3LEPYO805
Data cable	SAMSUNG	ECB-DU2EBE	N/A	N/A

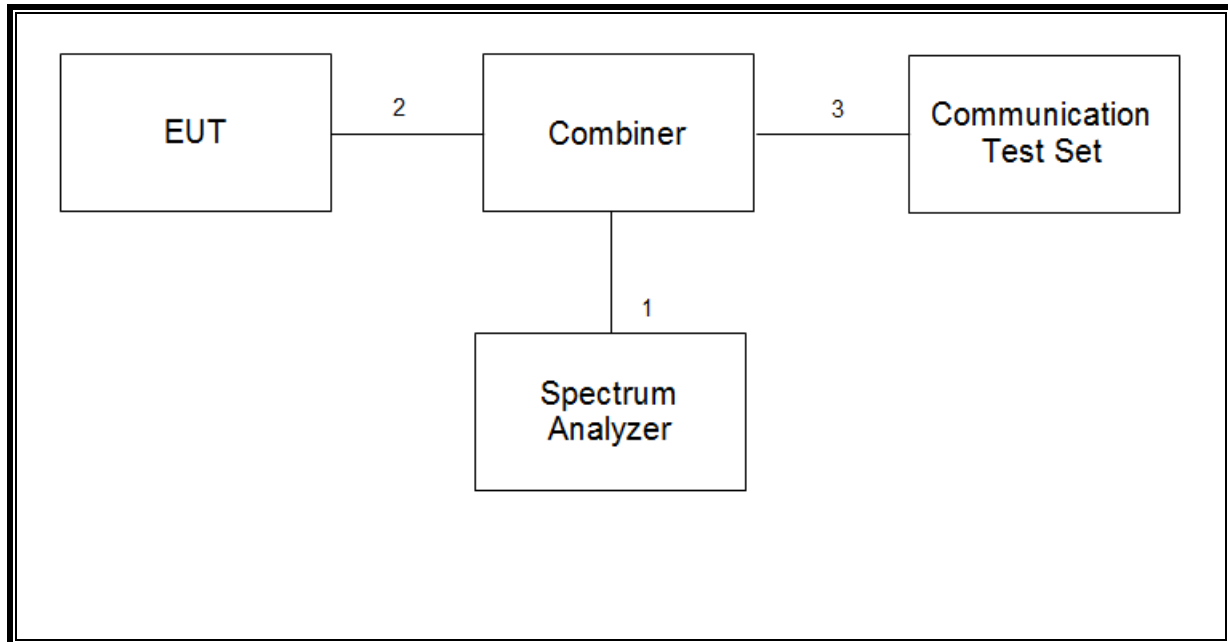
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	Mini-USB	Un-Shielded	1 m	N/A

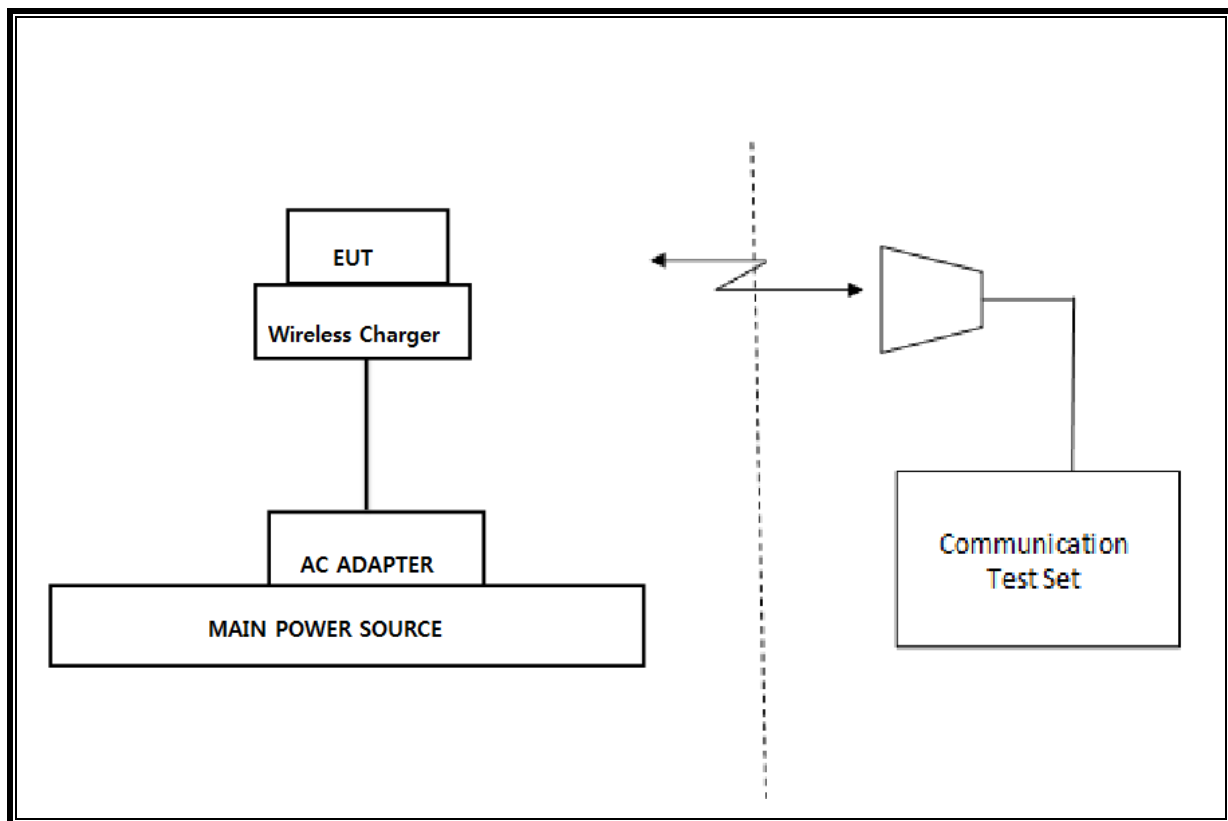
TEST SETUP

The EUT is continuously communicated to the call box during the tests.

SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)



SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment List				
Description	Manufacturer	Model	S/N	Cal Due
Antenna, Tuned Dipole 400~1000 MHz	ETS	3121D DB4	00164753	06-30-19
Antenna, Horn, 40 GHz	ETS	3116C	00166155	12-04-19
Preamplifier	ETS	3116C-PA	00168841	11-13-19
Antenna, Horn, 40 GHz	ETS	3116C	00168645	12-04-19
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	750	08-31-19
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	845	08-31-19
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	09-14-19
Antenna, Horn, 18 GHz	ETS	3115	00167211	10-14-18
Antenna, Horn, 18 GHz	ETS	3115	00161451	03-10-19
Antenna, Horn, 18 GHz	ETS	3117	00168724	05-31-19
Antenna, Horn, 18 GHz	ETS	3117	00205959	11-29-18
Antenna, Horn, 18 GHz	ETS	3117	00168717	05-31-19
Combiner	WEINSCHTEL	1575	2152	08-08-18
Communications Test Set	R&S	CMW500	115331	08-07-18
DC Power Supply	Agilent / HP	E3640A	MY54226395	08-07-18
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-09-18
Preamplifier, 1000 MHz	Sonoma	310N	370599	08-10-18
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-07-18
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	08-08-18
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	08-11-18
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	08-08-18
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	08-08-18
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-08-18
EMI Test Receive, 40 GHz	R&S	ESU40	100457	08-08-18
EMI Test Receive, 44 GHz	R&S	ESW40	101590	08-09-18
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G005	08-09-18
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G006	08-08-18
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	010	08-09-18
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	011	08-08-18
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G001	08-09-18
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G002	08-08-18
Attenuator	PASTERNAK	PE7087-10	A009	08-08-18
Attenuator	PASTERNAK	PE7087-10	A001	08-08-18
Attenuator	PASTERNAK	PE7087-10	A008	08-08-18
Attenuator	PASTERNAK	PE7087-10	2	08-10-18
Attenuator	PASTERNAK	PE7395-10	A011	02-12-19
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	10-26-19
Temperature Chamber	ESPEC	SH-642	93001109	08-08-18
UL Software				
Description	Manufacturer	Model	Version	
Antenna port test software	UL	CLT	Ver 2.4	

7. Summary Table

FCC Part Section	IC Section	Test Description	Test Limit	Test Condition	Test Result
2.1049	N/A	Occupied Band width (99%)	N/A	Conducted	Pass
22.359(a) 24.238(a) 27.53(c),(g),(h) 90.691	RSS-132 (5.5) RSS-133 (6.5) RSS-130 (4.6) RSS-139 (6.6)	Band Edge / Conducted Spurious Emission	-13dBm		Pass
90.691	N/A	Emission Mask	-13dBm or -20dBm		Pass
2.1046	2.1046	Conducted output power	N/A		See the RF exposure test report. (4788480988-S1 FCC Report SAR)
22.355 24.235 27.54 90.213	RSS-130 (4.3) RSS-132 (5.3) RSS-133 (6.3) RSS-139 (6.4)	Frequency Stability	2.5PPM		Pass
22.913(a)(5)	RSS-132 (5.4)	Effective Radiated Power	38.5 dBm	Radiated	Pass
90.635	N/A		50 dBm		Pass
27.50(b)(10) 27.50(c)(10)	RSS-130 (4.4)		34.77 dBm		Pass
24.232(c)	RSS-133 (6.4)	Equivalent Isotropic Radiated Power	33dBm		Pass
27.50(d)(4)	RSS-139 (6.5)		30dBm		Pass
22.917(a) 24.238(a) 27.53 (c),(g),(h) 90.691	RSS-132 (5.5) RSS-133 (6.5) RSS-130 (4.6) RSS-139 (6.6)	Radiated Spurious Emission	-13dBm		Pass
27.53(f)	RSS-130 (4.6)		-40dBm		Pass

8. PEAK TO AVERAGE RATIO

Test Procedure

Per KDB 971168 D01 Power Meas License Digital Systems v03r01;

The transmitter output was connected to a CMW500 Test Set and configured to operate at maximum power. The PAR were measured on the Spectrum Analyzer.

Test Spec

In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13 dB.

8.1. CONDUCTED PEAK TO AVERAGE RESULT

WCDMA

Band	Channel	f [MHz]	Mode	Ratio [dB]	Limit [dB]
Band 5	4183	836.6	REL99	3.18	13.00
			HSDPA	3.28	
Band 4	1413	1732.6	REL99	2.95	
			HSDPA	2.97	
Band 2	9400	1880.0	REL99	2.95	
			HSDPA	3.15	

LTE

Band	BW [MHz]	Channel	f [MHz]	Mode	Ratio [dB]	Limit [dB]
Band 12	10	23095	707.5	QPSK	4.20	13.00
				16QAM	5.43	
	5			QPSK	4.23	
				16QAM	5.47	
	3			QPSK	4.17	
				16QAM	5.47	
	1.4			QPSK	4.18	
				16QAM	5.42	
Band 13	10	23230	782	QPSK	4.17	
				16QAM	5.48	
	5			QPSK	4.05	
				16QAM	5.44	

LTE

Band	BW [MHz]	Channel	f [MHz]	Mode	Ratio [dB]	Limit [dB]
Band 25	20	26365	1882.5	QPSK	4.49	13.00
				16QAM	5.72	
	15			QPSK	4.54	
				16QAM	5.72	
	10			QPSK	4.57	
				16QAM	5.87	
	5			QPSK	4.66	
				16QAM	5.83	
	3			QPSK	4.62	
				16QAM	5.80	
1.4	QPSK	4.62				
	16QAM	5.66				
Band 26	15	26965	831.5	QPSK	4.10	13.00
				16QAM	5.44	
	10			QPSK	4.09	
				16QAM	5.22	
	5			QPSK	4.11	
				16QAM	5.25	
	3			QPSK	4.14	
				16QAM	5.27	
1.4	QPSK	4.14				
	16QAM	5.15				
Band 66	20	132322	1745.0	QPSK	4.17	13.00
				16QAM	5.24	
	15			QPSK	4.18	
				16QAM	5.14	
	10			QPSK	4.17	
				16QAM	5.31	
	5			QPSK	4.27	
				16QAM	5.48	
	3			QPSK	4.20	
				16QAM	5.28	
1.4	QPSK	4.18				
	16QAM	5.35				

LTE Band 2

LTE Band 2 (Frequency range: 1850-1910 MHz) is covered by LTE Band 25 (Frequency range: 1850-1915 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 4

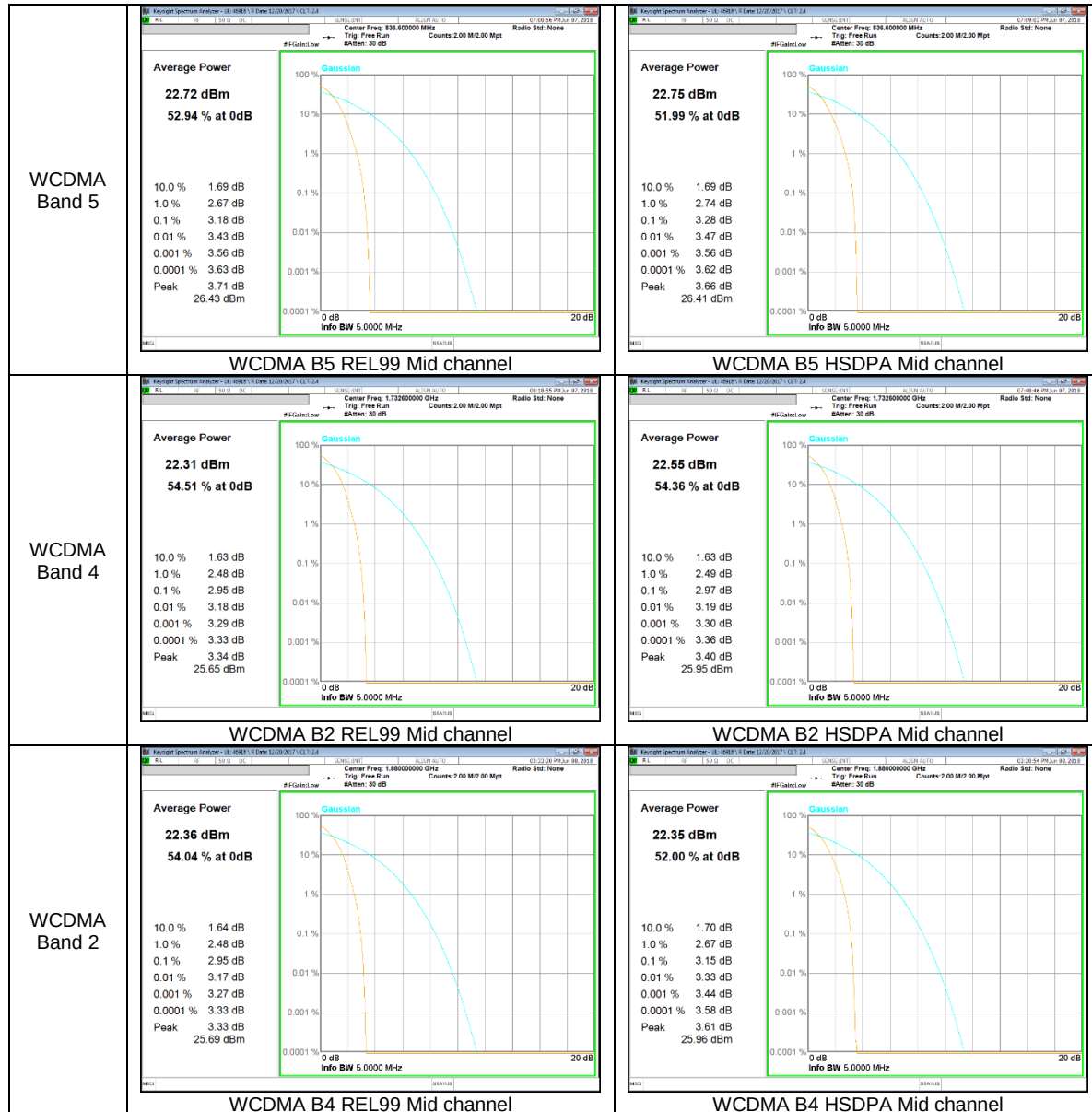
LTE Band 4 (Frequency range: 1710-1755 MHz) is covered by LTE Band 66 (Frequency range: 1710-1780 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 5

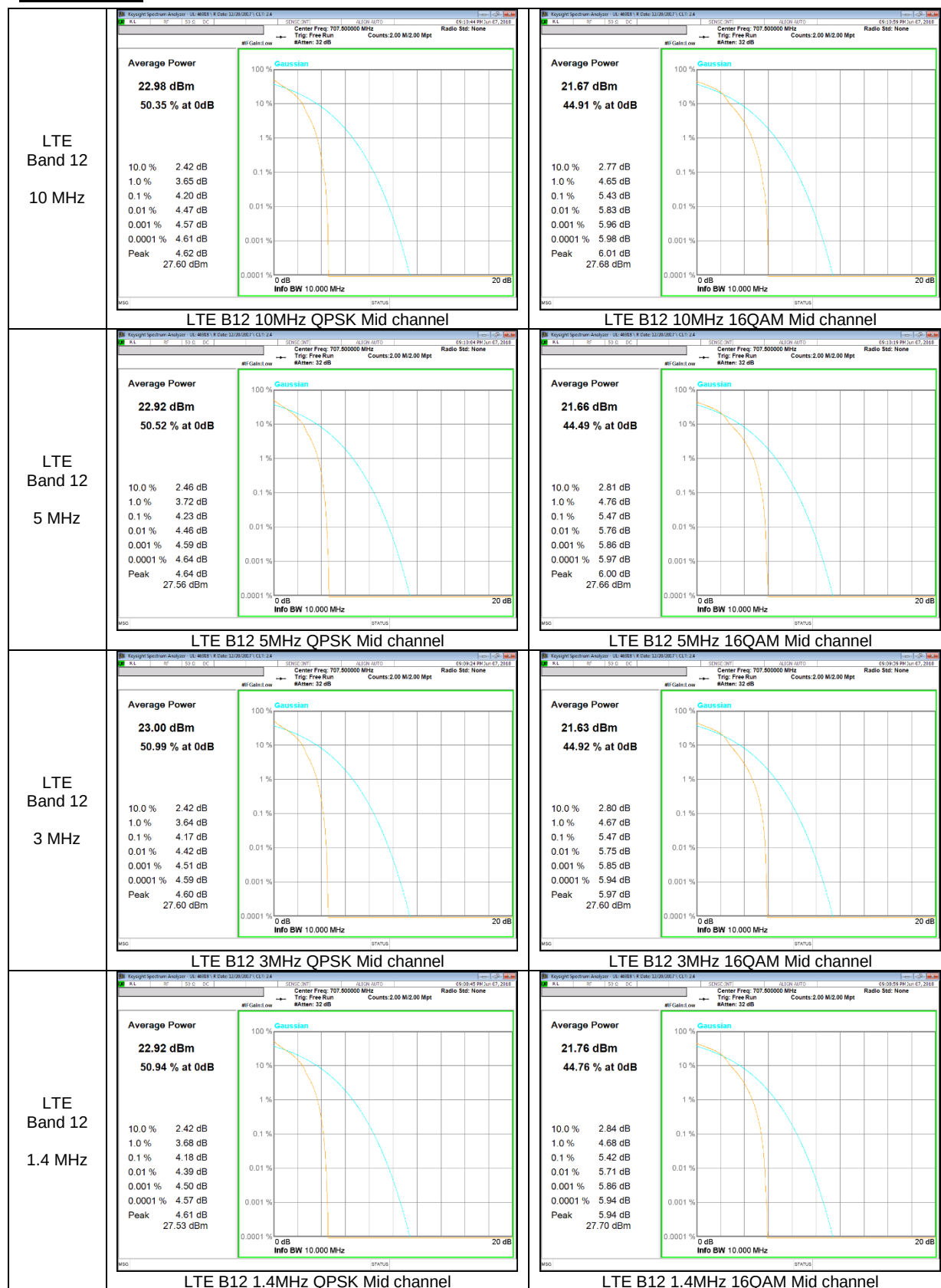
LTE Band 5 (Frequency range: 824-849 MHz) is covered by LTE Band 26 (Frequency range: 814-849 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

8.2. CONDUCTED PEAK TO AVERAGE PLOTS

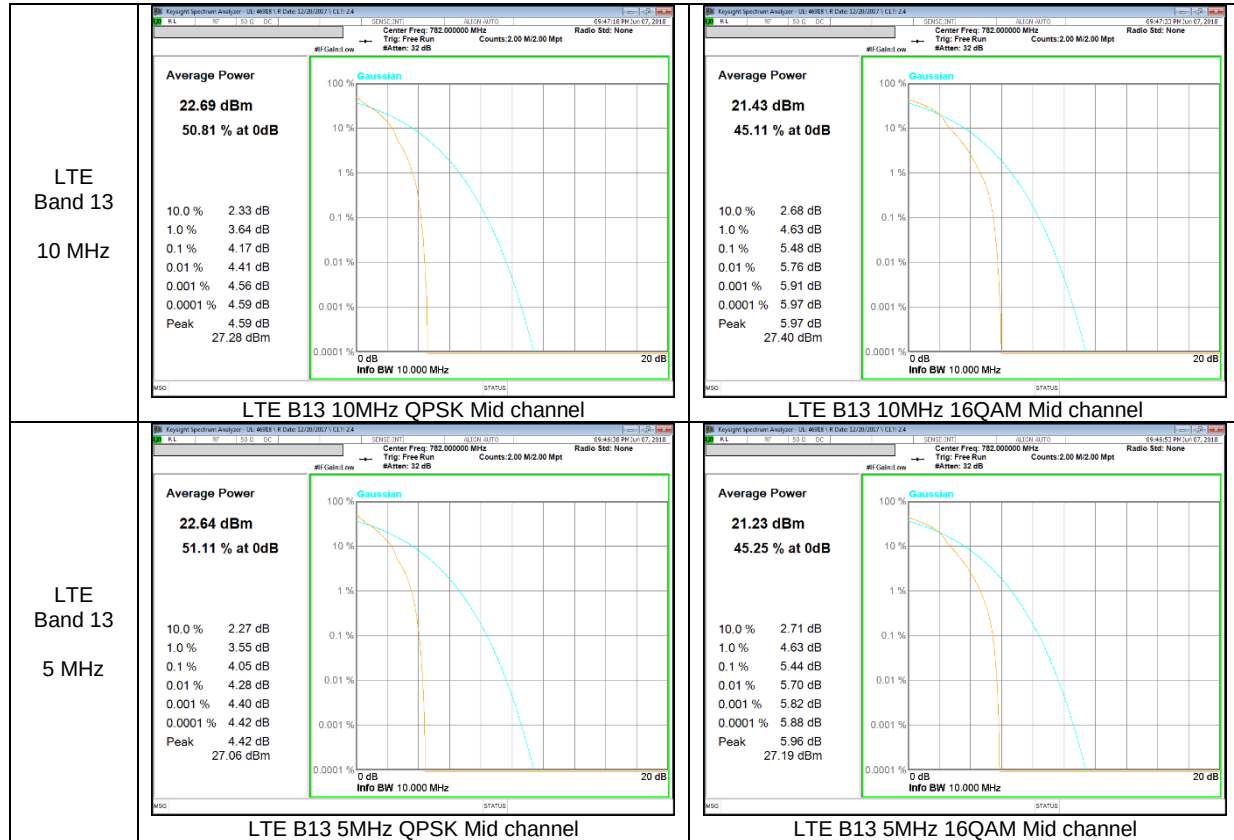
WCDMA



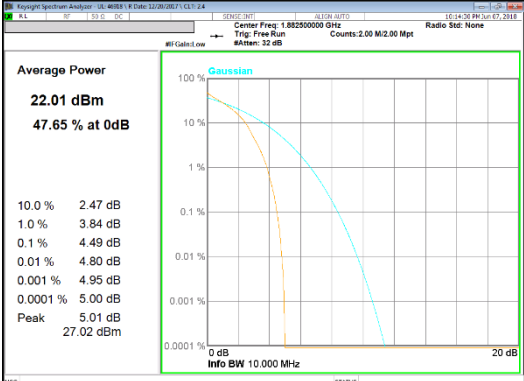
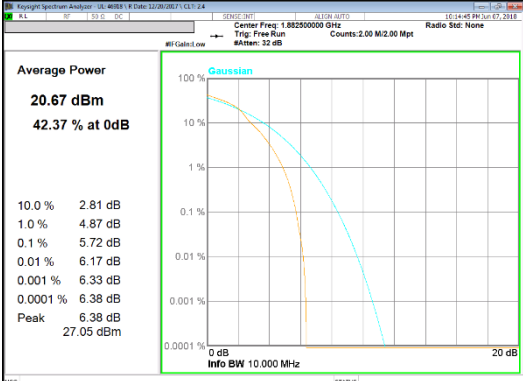
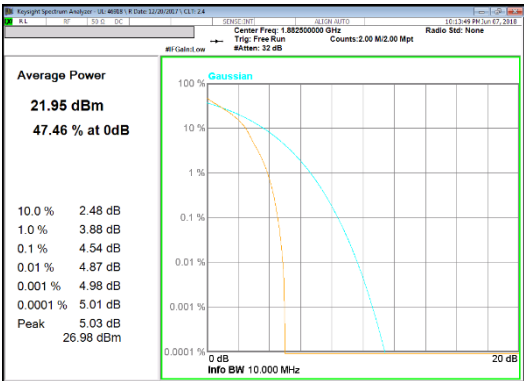
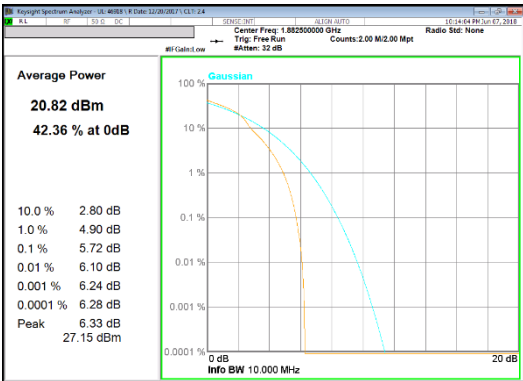
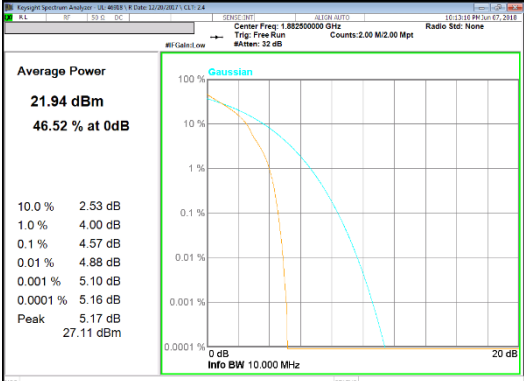
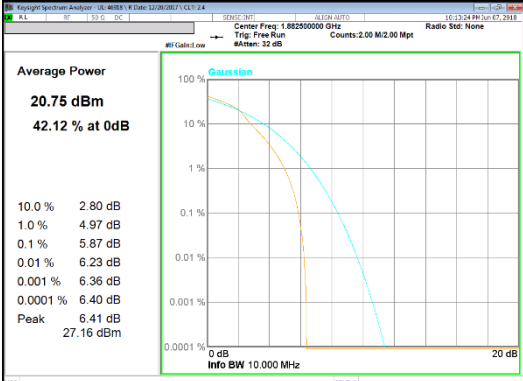
LTE Band 12

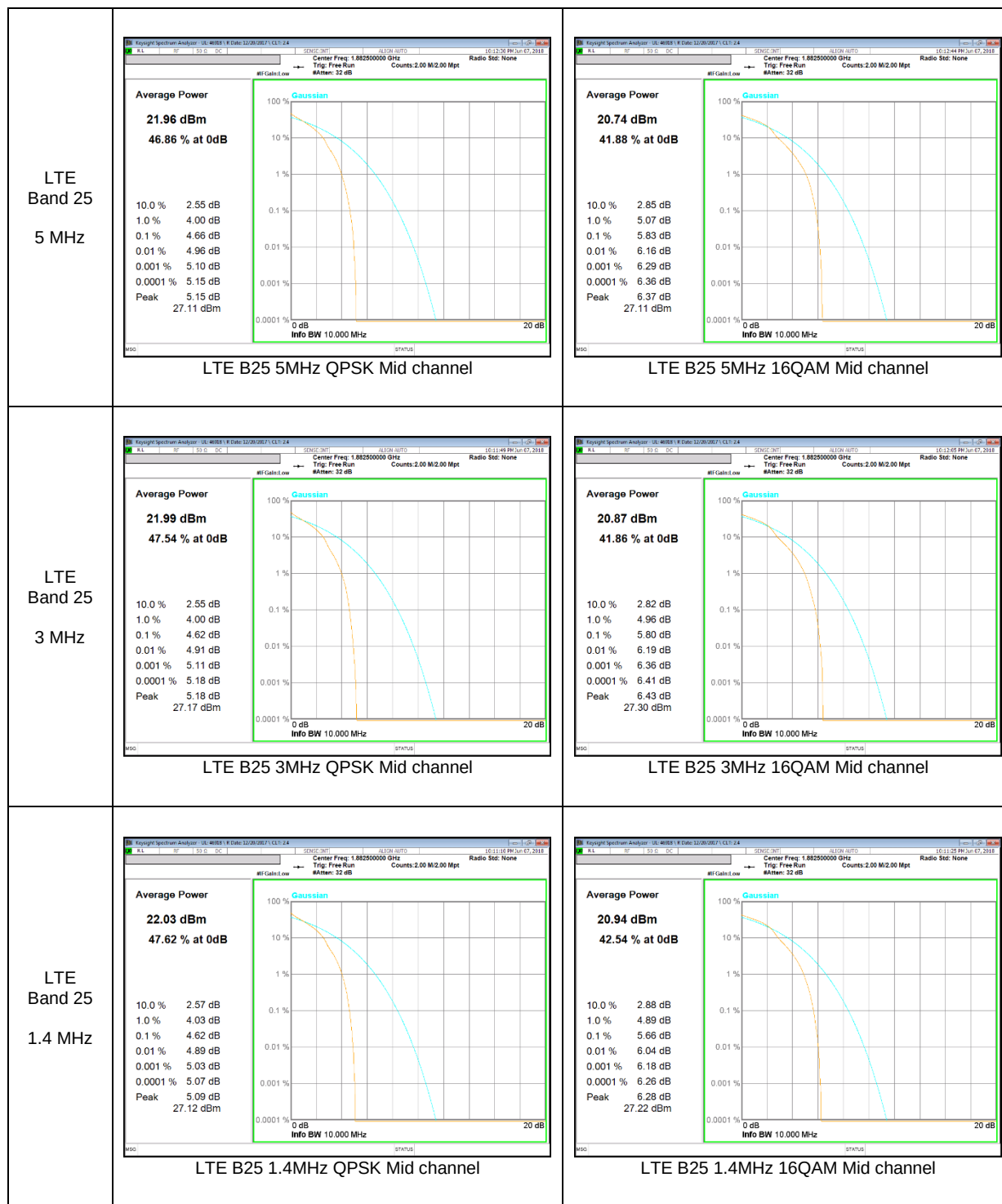


LTE Band 13

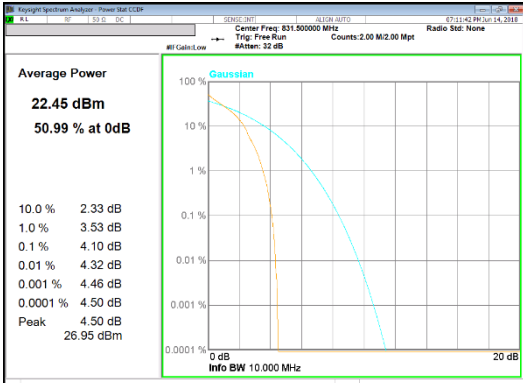
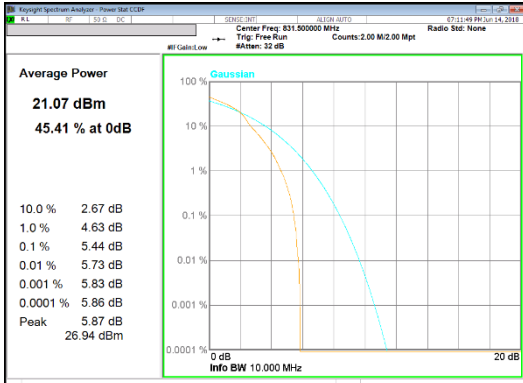
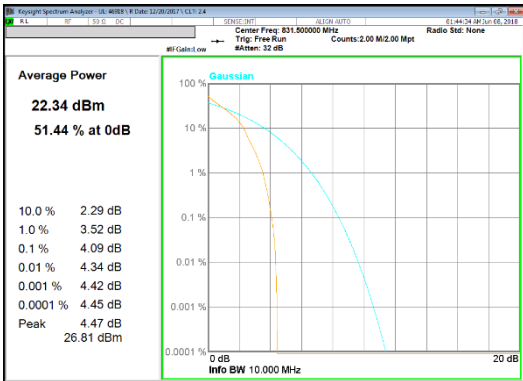
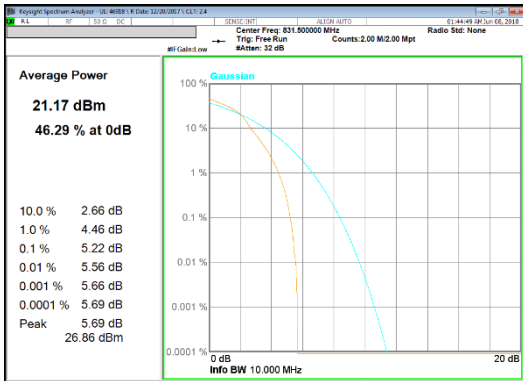
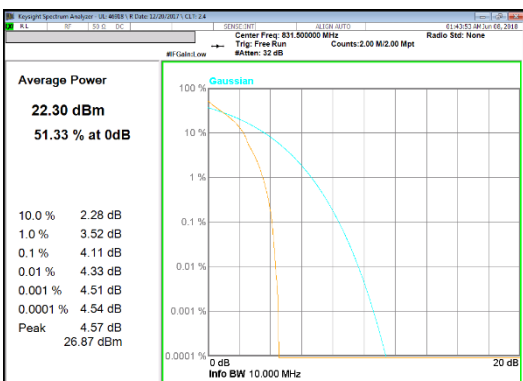
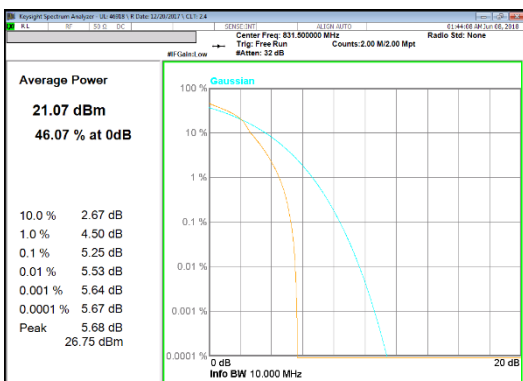


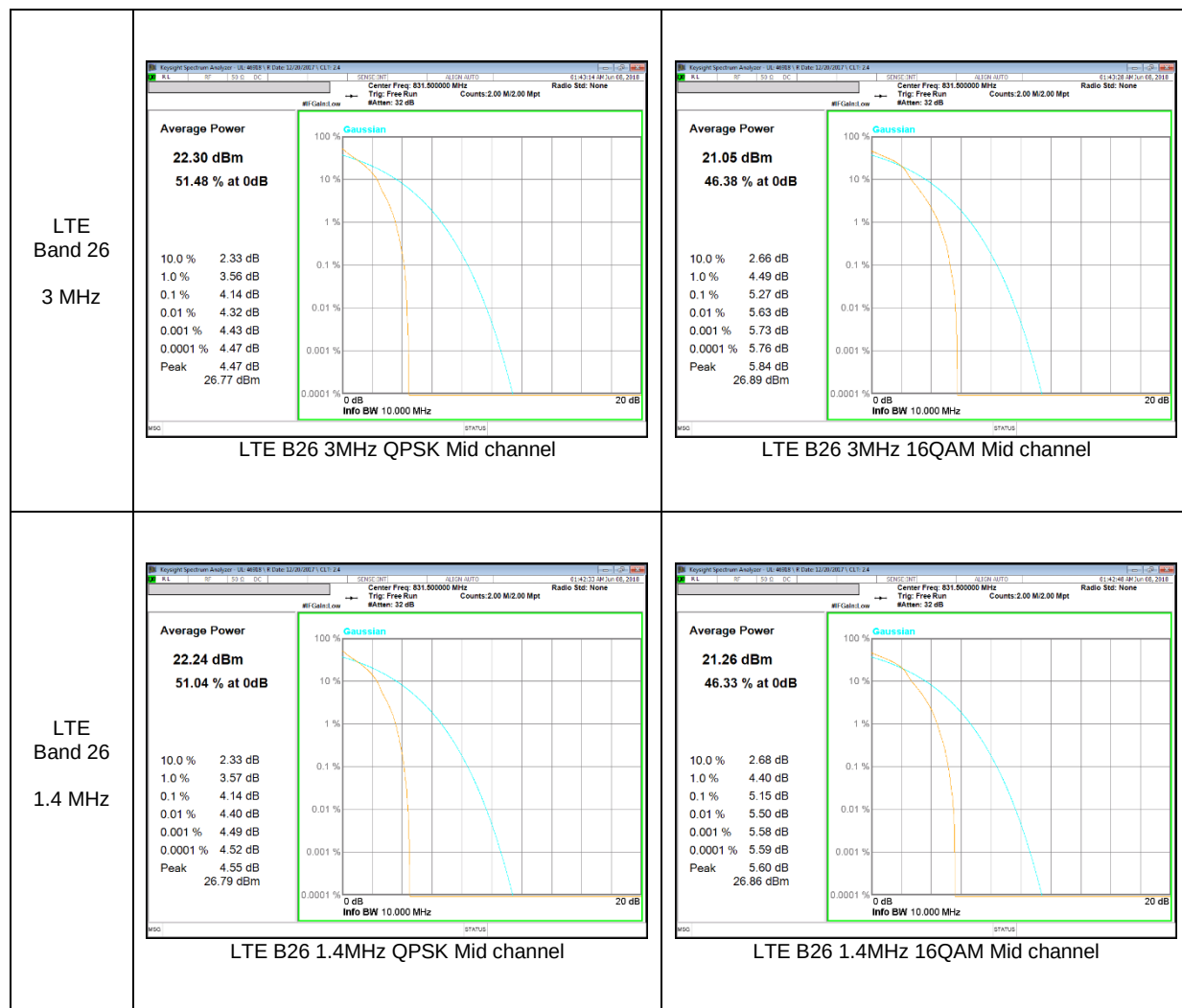
LTE Band 25

LTE Band 25 20 MHz	 LTE B25 20MHz QPSK Mid channel	 LTE B25 20MHz 16QAM Mid channel
LTE Band 25 15 MHz	 LTE B25 15MHz QPSK Mid channel	 LTE B25 15MHz 16QAM Mid channel
LTE Band 25 10 MHz	 LTE B25 10MHz QPSK Mid channel	 LTE B25 10MHz 16QAM Mid channel

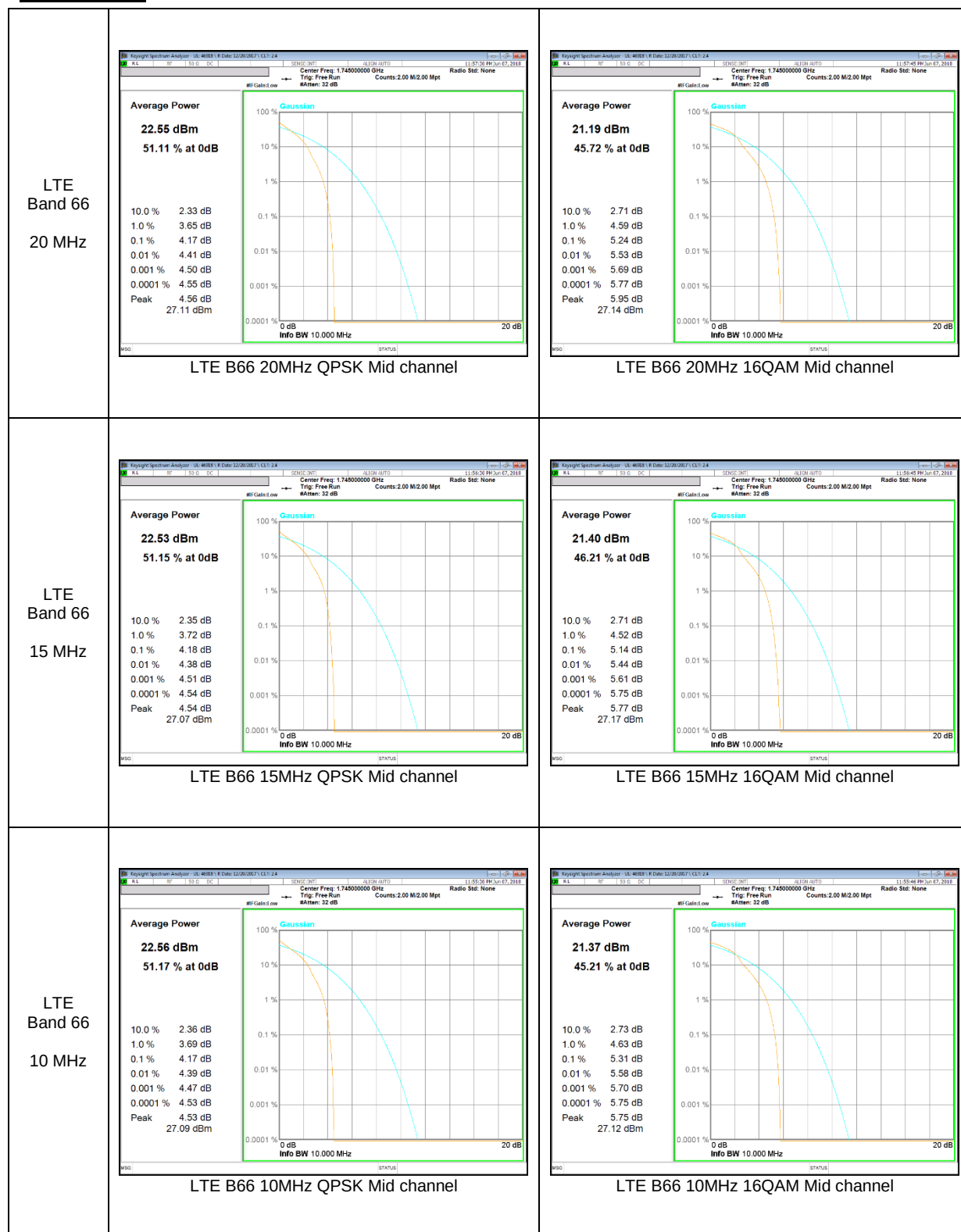


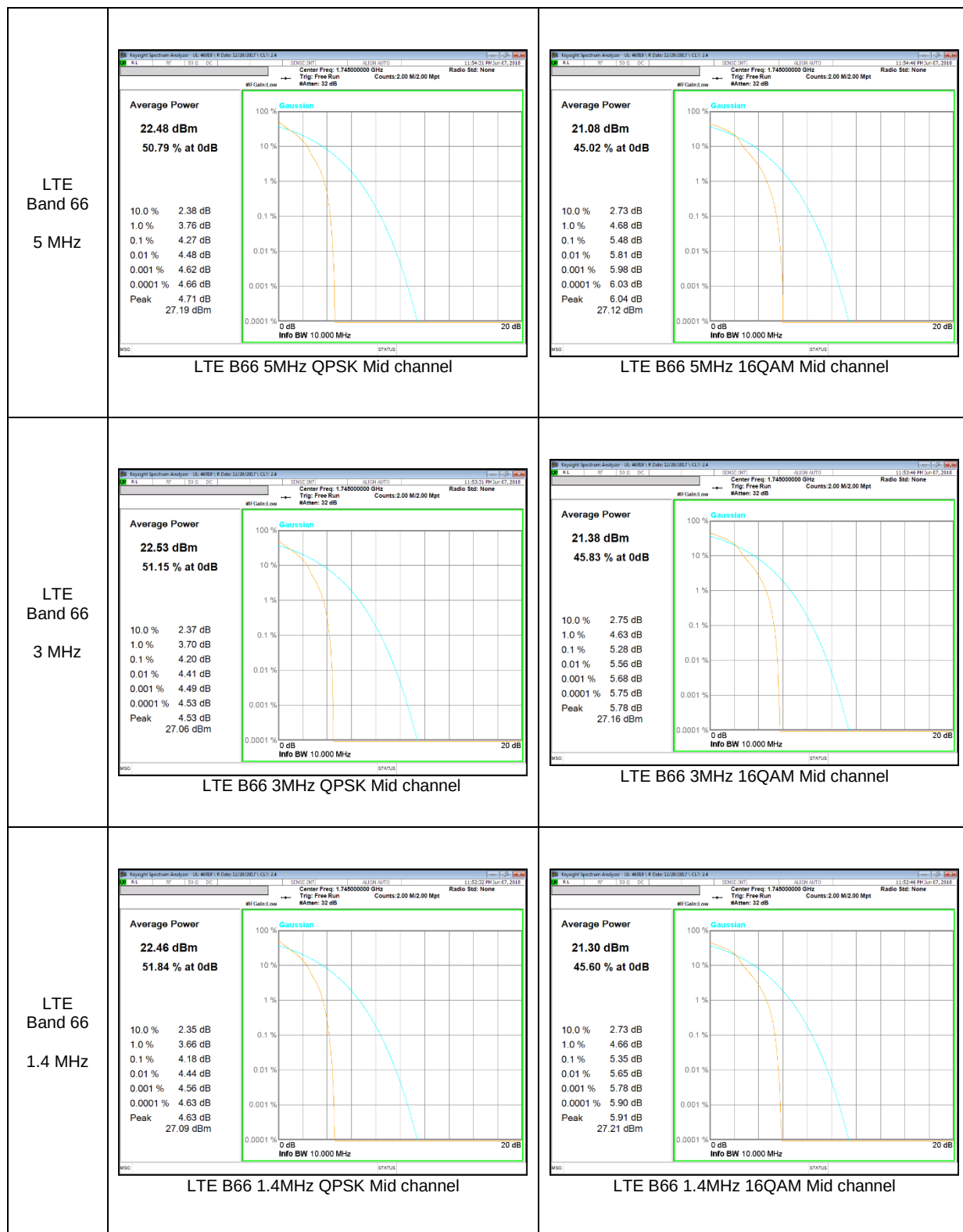
LTE Band 26

LTE Band 26 15 MHz	 Average Power 22.45 dBm 50.99 % at 0dB <table><tr><td>10.0 %</td><td>2.33 dB</td></tr><tr><td>1.0 %</td><td>3.53 dB</td></tr><tr><td>0.1 %</td><td>4.10 dB</td></tr><tr><td>0.01 %</td><td>4.32 dB</td></tr><tr><td>0.001 %</td><td>4.46 dB</td></tr><tr><td>0.0001 %</td><td>4.50 dB</td></tr><tr><td>Peak</td><td>4.50 dB</td></tr><tr><td></td><td>26.95 dBm</td></tr></table> Info BW 10.000 MHz	10.0 %	2.33 dB	1.0 %	3.53 dB	0.1 %	4.10 dB	0.01 %	4.32 dB	0.001 %	4.46 dB	0.0001 %	4.50 dB	Peak	4.50 dB		26.95 dBm	 Average Power 21.07 dBm 45.41 % at 0dB <table><tr><td>10.0 %</td><td>2.67 dB</td></tr><tr><td>1.0 %</td><td>4.63 dB</td></tr><tr><td>0.1 %</td><td>5.44 dB</td></tr><tr><td>0.01 %</td><td>5.73 dB</td></tr><tr><td>0.001 %</td><td>5.83 dB</td></tr><tr><td>0.0001 %</td><td>5.86 dB</td></tr><tr><td>Peak</td><td>5.87 dB</td></tr><tr><td></td><td>26.94 dBm</td></tr></table> Info BW 10.000 MHz	10.0 %	2.67 dB	1.0 %	4.63 dB	0.1 %	5.44 dB	0.01 %	5.73 dB	0.001 %	5.83 dB	0.0001 %	5.86 dB	Peak	5.87 dB		26.94 dBm
10.0 %	2.33 dB																																	
1.0 %	3.53 dB																																	
0.1 %	4.10 dB																																	
0.01 %	4.32 dB																																	
0.001 %	4.46 dB																																	
0.0001 %	4.50 dB																																	
Peak	4.50 dB																																	
	26.95 dBm																																	
10.0 %	2.67 dB																																	
1.0 %	4.63 dB																																	
0.1 %	5.44 dB																																	
0.01 %	5.73 dB																																	
0.001 %	5.83 dB																																	
0.0001 %	5.86 dB																																	
Peak	5.87 dB																																	
	26.94 dBm																																	
LTE Band 26 10 MHz	 Average Power 22.34 dBm 51.44 % at 0dB <table><tr><td>10.0 %</td><td>2.29 dB</td></tr><tr><td>1.0 %</td><td>3.52 dB</td></tr><tr><td>0.1 %</td><td>4.09 dB</td></tr><tr><td>0.01 %</td><td>4.34 dB</td></tr><tr><td>0.001 %</td><td>4.42 dB</td></tr><tr><td>0.0001 %</td><td>4.45 dB</td></tr><tr><td>Peak</td><td>4.47 dB</td></tr><tr><td></td><td>26.81 dBm</td></tr></table> Info BW 10.000 MHz	10.0 %	2.29 dB	1.0 %	3.52 dB	0.1 %	4.09 dB	0.01 %	4.34 dB	0.001 %	4.42 dB	0.0001 %	4.45 dB	Peak	4.47 dB		26.81 dBm	 Average Power 21.17 dBm 46.29 % at 0dB <table><tr><td>10.0 %</td><td>2.66 dB</td></tr><tr><td>1.0 %</td><td>4.46 dB</td></tr><tr><td>0.1 %</td><td>5.22 dB</td></tr><tr><td>0.01 %</td><td>5.56 dB</td></tr><tr><td>0.001 %</td><td>5.66 dB</td></tr><tr><td>0.0001 %</td><td>5.69 dB</td></tr><tr><td>Peak</td><td>5.69 dB</td></tr><tr><td></td><td>26.86 dBm</td></tr></table> Info BW 10.000 MHz	10.0 %	2.66 dB	1.0 %	4.46 dB	0.1 %	5.22 dB	0.01 %	5.56 dB	0.001 %	5.66 dB	0.0001 %	5.69 dB	Peak	5.69 dB		26.86 dBm
10.0 %	2.29 dB																																	
1.0 %	3.52 dB																																	
0.1 %	4.09 dB																																	
0.01 %	4.34 dB																																	
0.001 %	4.42 dB																																	
0.0001 %	4.45 dB																																	
Peak	4.47 dB																																	
	26.81 dBm																																	
10.0 %	2.66 dB																																	
1.0 %	4.46 dB																																	
0.1 %	5.22 dB																																	
0.01 %	5.56 dB																																	
0.001 %	5.66 dB																																	
0.0001 %	5.69 dB																																	
Peak	5.69 dB																																	
	26.86 dBm																																	
LTE Band 26 5 MHz	 Average Power 22.30 dBm 51.33 % at 0dB <table><tr><td>10.0 %</td><td>2.28 dB</td></tr><tr><td>1.0 %</td><td>3.52 dB</td></tr><tr><td>0.1 %</td><td>4.11 dB</td></tr><tr><td>0.01 %</td><td>4.33 dB</td></tr><tr><td>0.001 %</td><td>4.51 dB</td></tr><tr><td>0.0001 %</td><td>4.54 dB</td></tr><tr><td>Peak</td><td>4.57 dB</td></tr><tr><td></td><td>26.87 dBm</td></tr></table> Info BW 10.000 MHz	10.0 %	2.28 dB	1.0 %	3.52 dB	0.1 %	4.11 dB	0.01 %	4.33 dB	0.001 %	4.51 dB	0.0001 %	4.54 dB	Peak	4.57 dB		26.87 dBm	 Average Power 21.07 dBm 46.07 % at 0dB <table><tr><td>10.0 %</td><td>2.67 dB</td></tr><tr><td>1.0 %</td><td>4.50 dB</td></tr><tr><td>0.1 %</td><td>5.25 dB</td></tr><tr><td>0.01 %</td><td>5.53 dB</td></tr><tr><td>0.001 %</td><td>5.64 dB</td></tr><tr><td>0.0001 %</td><td>5.67 dB</td></tr><tr><td>Peak</td><td>5.68 dB</td></tr><tr><td></td><td>26.75 dBm</td></tr></table> Info BW 10.000 MHz	10.0 %	2.67 dB	1.0 %	4.50 dB	0.1 %	5.25 dB	0.01 %	5.53 dB	0.001 %	5.64 dB	0.0001 %	5.67 dB	Peak	5.68 dB		26.75 dBm
10.0 %	2.28 dB																																	
1.0 %	3.52 dB																																	
0.1 %	4.11 dB																																	
0.01 %	4.33 dB																																	
0.001 %	4.51 dB																																	
0.0001 %	4.54 dB																																	
Peak	4.57 dB																																	
	26.87 dBm																																	
10.0 %	2.67 dB																																	
1.0 %	4.50 dB																																	
0.1 %	5.25 dB																																	
0.01 %	5.53 dB																																	
0.001 %	5.64 dB																																	
0.0001 %	5.67 dB																																	
Peak	5.68 dB																																	
	26.75 dBm																																	



LTE Band 66





9. LIMITS AND CONDUCTED RESULTS

9.1. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The -26dB bandwidth was also measured and recorded.

(KDB 971168 D01 Power Meas License Digital Systems v03r01)

9.1.1. OCCUPIED BANDWIDTH RESULTS

WCDMA

Band	Mode	Channel	f [MHz]	99% BW [MHz]	26dB BW [MHz]
Band 5	REL99	4132	826.4	4.1416	4.696
		4183	836.6	4.1338	4.682
		4233	846.6	4.1357	4.640
	HSDPA	4132	826.4	4.1449	4.690
		4183	836.6	4.1443	4.671
		4233	846.6	4.1338	4.678
Band 4	REL99	1312	1712.4	4.1503	4.706
		1413	1732.6	4.1437	4.701
		1513	1752.6	4.1562	4.731
	HSDPA	1312	1712.4	4.1374	4.714
		1413	1732.6	4.1548	4.715
		1513	1752.6	4.1418	4.720
Band 2	REL99	9262	1852.4	4.1506	4.681
		9400	1880.0	4.1499	4.718
		9538	1907.6	4.1475	4.699
	HSDPA	9262	1852.4	4.1501	4.670
		9400	1880.0	4.1522	4.693
		9538	1907.6	4.1585	4.716

LTE Band 12

Band	BW [MHz]	Channel	f [MHz]	Mode	99% BW [MHz]	26dB BW [MHz]
Band 12	10	23060	704.0	QPSK	8.9579	10.230
				16QAM	8.9545	10.180
		23095	707.5	QPSK	8.9316	9.986
				16QAM	8.9288	10.080
		23130	711.0	QPSK	8.9691	10.110
				16QAM	8.9716	10.270
	5	23035	701.5	QPSK	4.4974	5.223
				16QAM	4.5008	5.223
		23095	707.5	QPSK	4.4834	5.233
				16QAM	4.4894	5.098
		23155	713.5	QPSK	4.5082	5.245
				16QAM	4.4994	5.270
	3	23025	700.5	QPSK	2.6996	3.100
				16QAM	2.6994	3.105
		23095	707.5	QPSK	2.6950	3.088
				16QAM	2.6935	3.102
		23165	714.5	QPSK	2.6931	3.081
				16QAM	2.6925	3.079
	1.4	23017	699.7	QPSK	1.0882	1.303
				16QAM	1.0891	1.304
		23095	707.5	QPSK	1.0842	1.272
				16QAM	1.0885	1.314
		23173	715.3	QPSK	1.0900	1.295
				16QAM	1.0888	1.328

LTE Band 13

Band	BW [MHz]	Channel	f [MHz]	Mode	99% BW [MHz]	26dB BW [MHz]
Band 13	10	23230	782.0	QPSK	8.9414	10.160
				16QAM	8.9372	10.130
	5	23207	779.5	QPSK	4.4968	5.167
				16QAM	4.5000	5.270
		23230	782.0	QPSK	4.4999	5.282
				16QAM	4.4904	5.321
		23255	784.5	QPSK	4.4979	5.282
				16QAM	4.4940	5.160

LTE Band 25

Band	BW [MHz]	Channel	f [MHz]	Mode	99% BW [MHz]	26dB BW [MHz]
Band 25	20	26140	1860.0	QPSK	17.855	19.57
				16QAM	17.877	19.75
		26365	1882.5	QPSK	17.904	19.72
				16QAM	17.902	19.87
		26590	1905.0	QPSK	17.897	19.63
				16QAM	17.880	19.70
	15	26115	1857.5	QPSK	13.444	15.10
				16QAM	13.434	14.92
		26365	1882.5	QPSK	13.458	15.29
				16QAM	13.451	15.08
		26615	1907.5	QPSK	13.470	15.46
				16QAM	13.458	15.02
	10	26090	1855.0	QPSK	8.9842	10.28
				16QAM	8.9547	10.09
		26365	1882.5	QPSK	8.9656	10.20
				16QAM	8.9667	10.18
		26640	1910.0	QPSK	8.9563	10.34
				16QAM	8.9503	10.23
	5	26065	1852.5	QPSK	4.5007	5.269
				16QAM	4.4989	5.274
		26365	1882.5	QPSK	4.5012	5.308
				16QAM	4.4999	5.279
		26665	1912.5	QPSK	4.5007	5.584
				16QAM	4.5104	5.294
	3	26055	1851.5	QPSK	2.6959	3.100
				16QAM	2.6975	3.056
		26365	1882.5	QPSK	2.7087	3.124
				16QAM	2.7022	3.089
		26675	1913.5	QPSK	2.7057	3.499
				16QAM	2.7028	3.421
	1.4	26047	1850.7	QPSK	1.0877	1.303
				16QAM	1.0884	1.311
		26365	1882.5	QPSK	1.0868	1.321
				16QAM	1.0833	1.290
		26683	1914.3	QPSK	1.0996	1.771
				16QAM	1.0997	1.816

LTE Band 26

Band	BW [MHz]	Channel	f [MHz]	Mode	99% BW [MHz]	26dB BW [MHz]
Band 26	15	26765	821.5	QPSK	13.421	15.15
				16QAM	13.420	15.00
		26865	831.5	QPSK	13.420	15.12
				16QAM	13.432	15.25
		26965	841.5	QPSK	13.403	15.08
				16QAM	13.422	14.88
	10	26740	819.0	QPSK	8.9719	10.28
				16QAM	8.9634	10.29
		26840	829.0	QPSK	8.9602	10.05
				16QAM	8.9777	10.27
		26865	831.5	QPSK	8.9678	10.43
				16QAM	8.9733	10.20
		26990	844.0	QPSK	8.9591	10.11
				16QAM	8.9923	10.46
	5	26715	816.5	QPSK	4.5022	5.326
				16QAM	4.4953	5.298
		26765	821.5	QPSK	4.5028	5.311
				16QAM	4.5065	5.316
		26815	826.5	QPSK	4.4980	5.279
				16QAM	4.4887	5.249
		26865	831.5	QPSK	4.5010	5.306
				16QAM	4.5051	5.363
		27015	846.5	QPSK	4.5074	5.263
				16QAM	4.5074	5.281
	3	26705	815.5	QPSK	2.7011	3.147
				16QAM	2.7006	3.108
		26775	822.5	QPSK	2.6842	3.047
				16QAM	2.6955	3.115
		26805	825.5	QPSK	2.6961	3.095
				16QAM	2.6992	3.046
		26865	831.5	QPSK	2.7106	3.137
				16QAM	2.7090	3.071
		27025	847.5	QPSK	2.7030	3.091
				16QAM	2.6971	3.117
	1.4	26697	814.7	QPSK	1.0917	1.314
				16QAM	1.0894	1.287
		26783	823.3	QPSK	1.0855	1.280
				16QAM	1.0864	1.304
		26797	824.7	QPSK	1.0860	1.294
				16QAM	1.0879	1.297
		26865	831.5	QPSK	1.0887	1.317
				16QAM	1.0884	1.316
		27033	848.3	QPSK	1.0865	1.332
				16QAM	1.0927	1.339

LTE Band 66

Band	BW [MHz]	Channel	f [MHz]	Mode	99% BW [MHz]	26dB BW [MHz]
Band 66	20	132072	1720.0	QPSK	17.919	19.72
				16QAM	17.887	19.94
		132322	1745.0	QPSK	17.873	19.75
				16QAM	17.884	19.63
		132572	1770.0	QPSK	17.906	19.67
				16QAM	17.908	19.55
	15	132047	1717.5	QPSK	13.439	15.18
				16QAM	13.459	15.11
		132322	1745.0	QPSK	13.447	15.35
				16QAM	13.447	15.31
		132597	1772.5	QPSK	13.418	15.03
				16QAM	13.444	15.09
	10	132022	1715.0	QPSK	8.9743	10.34
				16QAM	8.9725	10.28
		132322	1745.0	QPSK	8.9700	10.17
				16QAM	8.9845	10.56
		132622	1775.0	QPSK	8.9698	10.19
				16QAM	8.9795	10.44
	5	131997	1712.5	QPSK	4.4939	5.357
				16QAM	4.5105	5.282
		132322	1745.0	QPSK	4.5018	5.239
				16QAM	4.5075	5.321
		132647	1775.5	QPSK	4.4912	5.258
				16QAM	4.4960	5.309
	3	131987	1711.5	QPSK	2.6999	3.038
				16QAM	2.7053	3.131
		132322	1745.0	QPSK	2.7034	3.075
				16QAM	2.7019	3.099
		132657	1778.5	QPSK	2.7044	3.054
				16QAM	2.7015	3.101
	1.4	131979	1710.7	QPSK	1.0863	1.302
				16QAM	1.0861	1.329
		132322	1745.0	QPSK	1.0901	1.293
				16QAM	1.0870	1.323
		132665	1779.3	QPSK	1.0850	1.300
				16QAM	1.0872	1.337

LTE Band 2

LTE Band 2 (Frequency range: 1850-1910 MHz) is covered by LTE Band 25 (Frequency range: 1850-1915 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 4

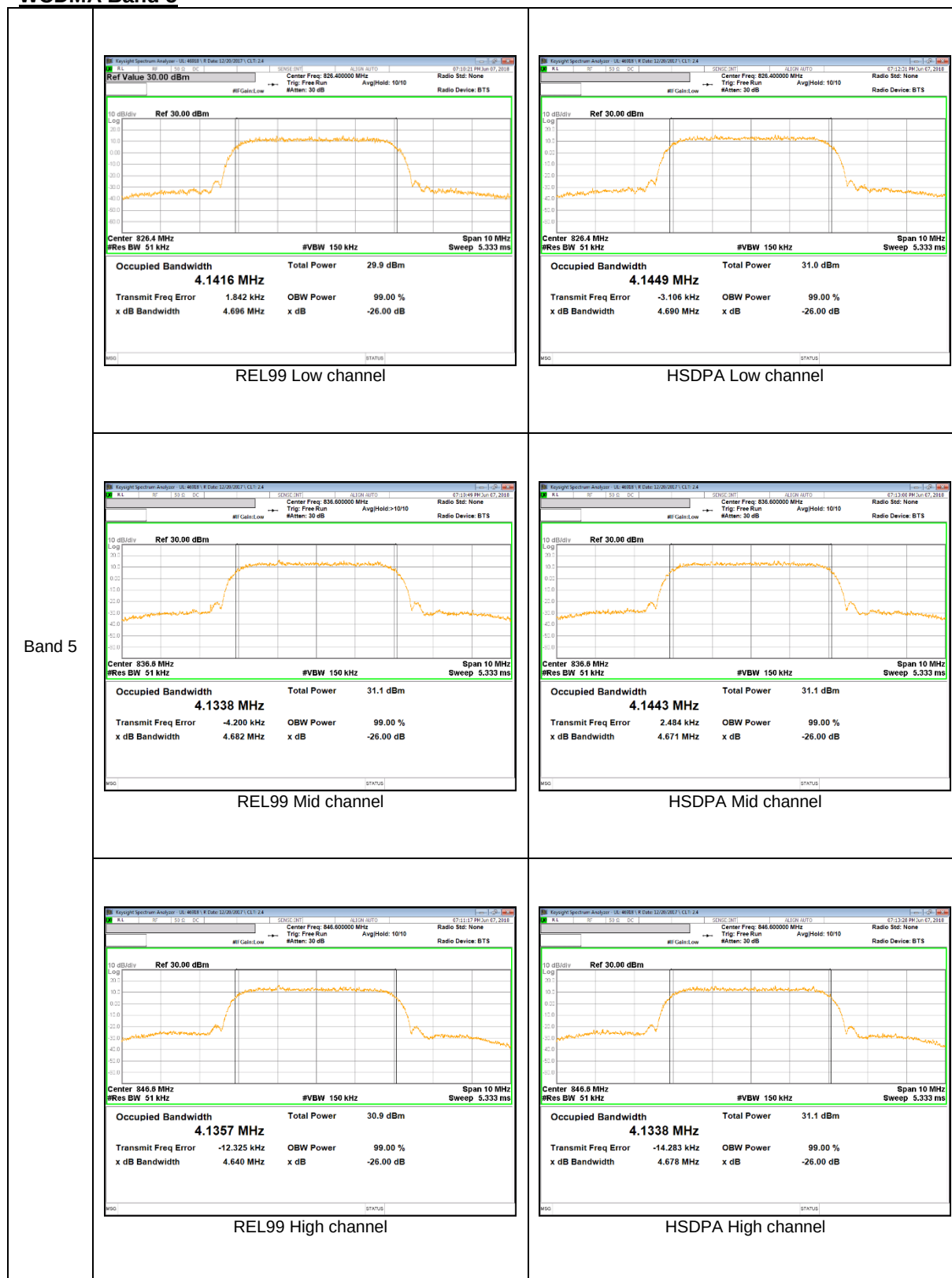
LTE Band 4 (Frequency range: 1710-1755 MHz) is covered by LTE Band 66 (Frequency range: 1710-1780 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 5

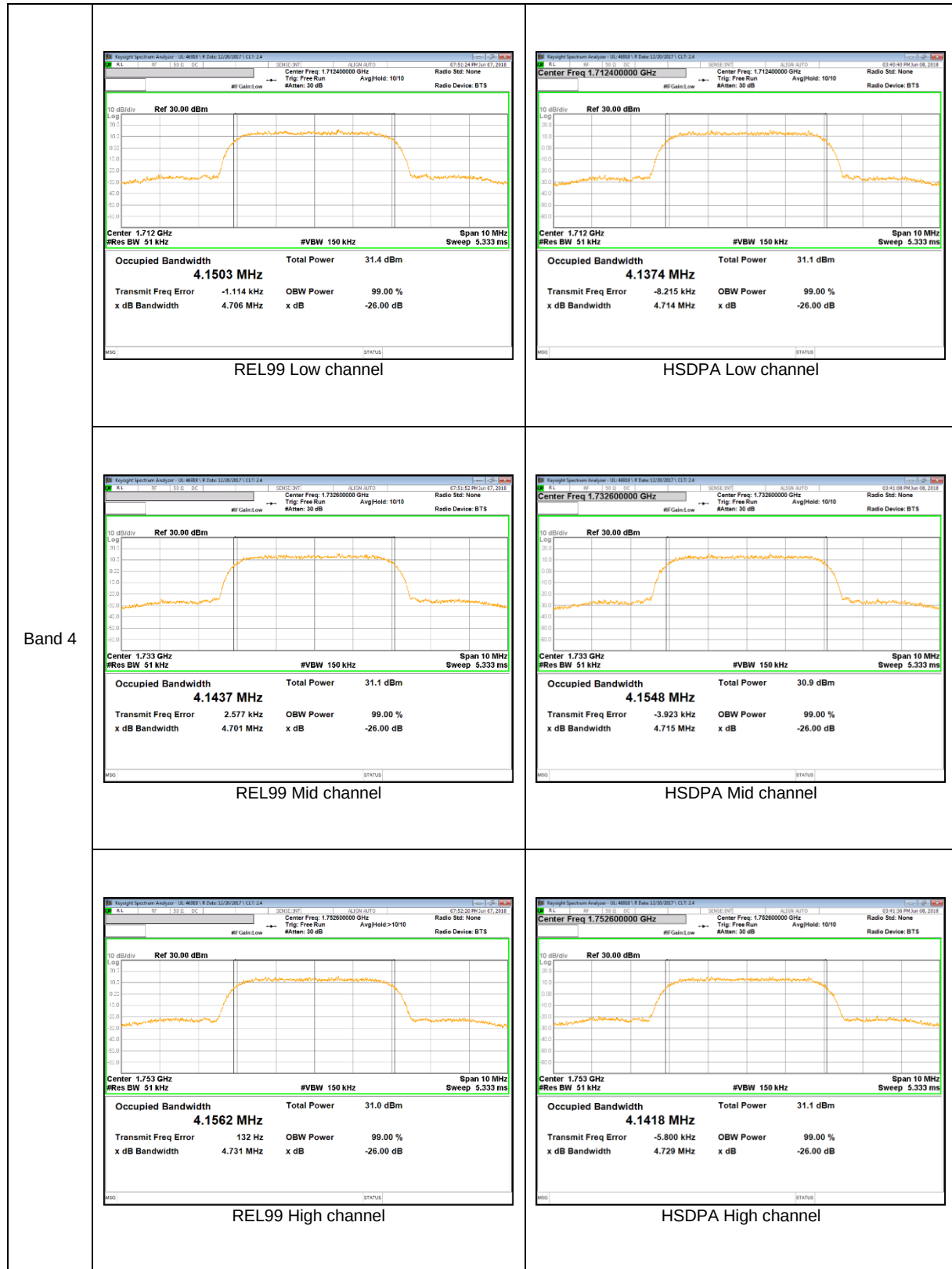
LTE Band 5 (Frequency range: 824-849 MHz) is covered by LTE Band 26 (Frequency range: 814-849 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

9.1.2. OCCUPIED BANDWIDTH PLOTS

WCDMA Band 5



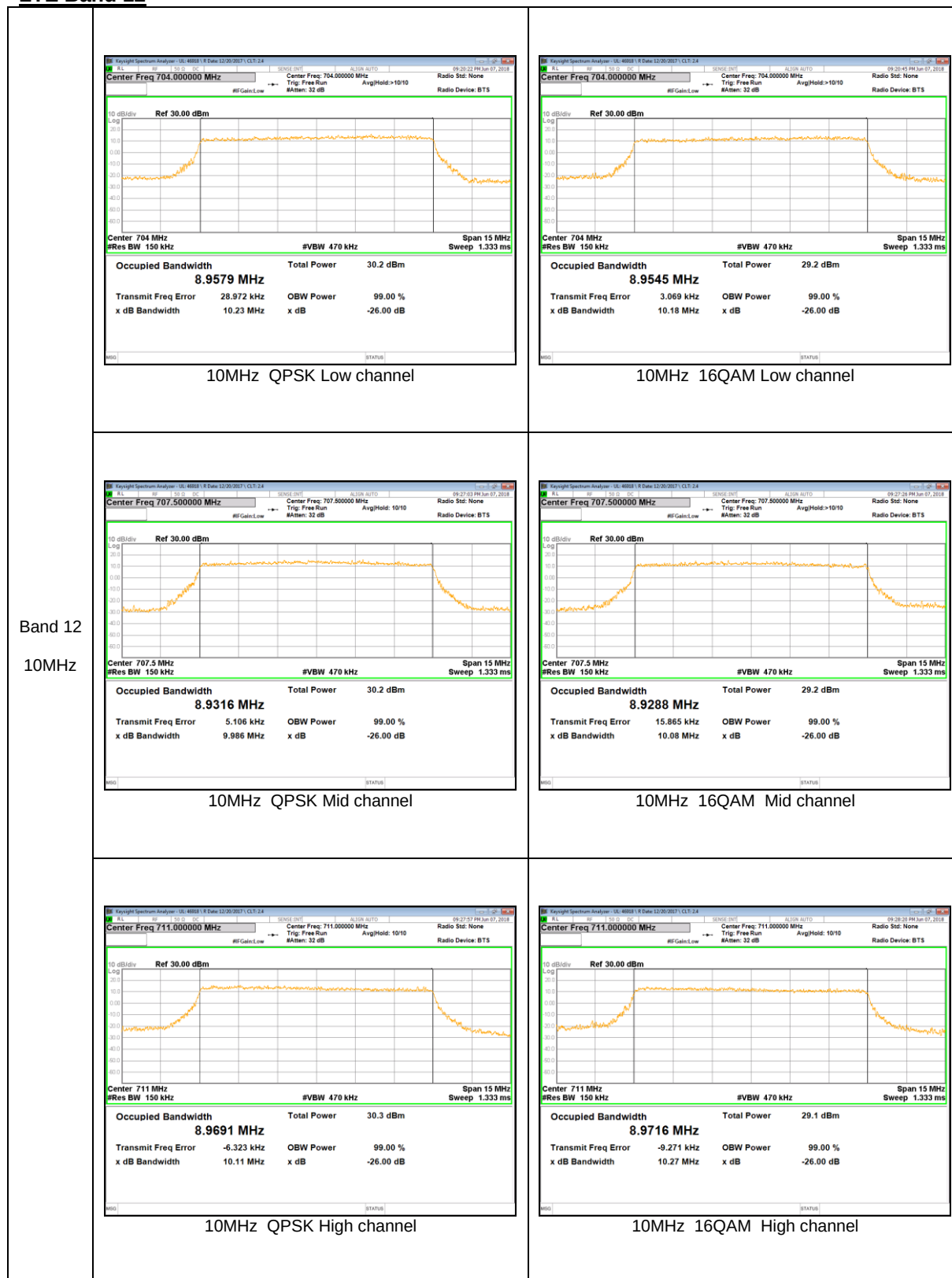
WCDMA Band 4

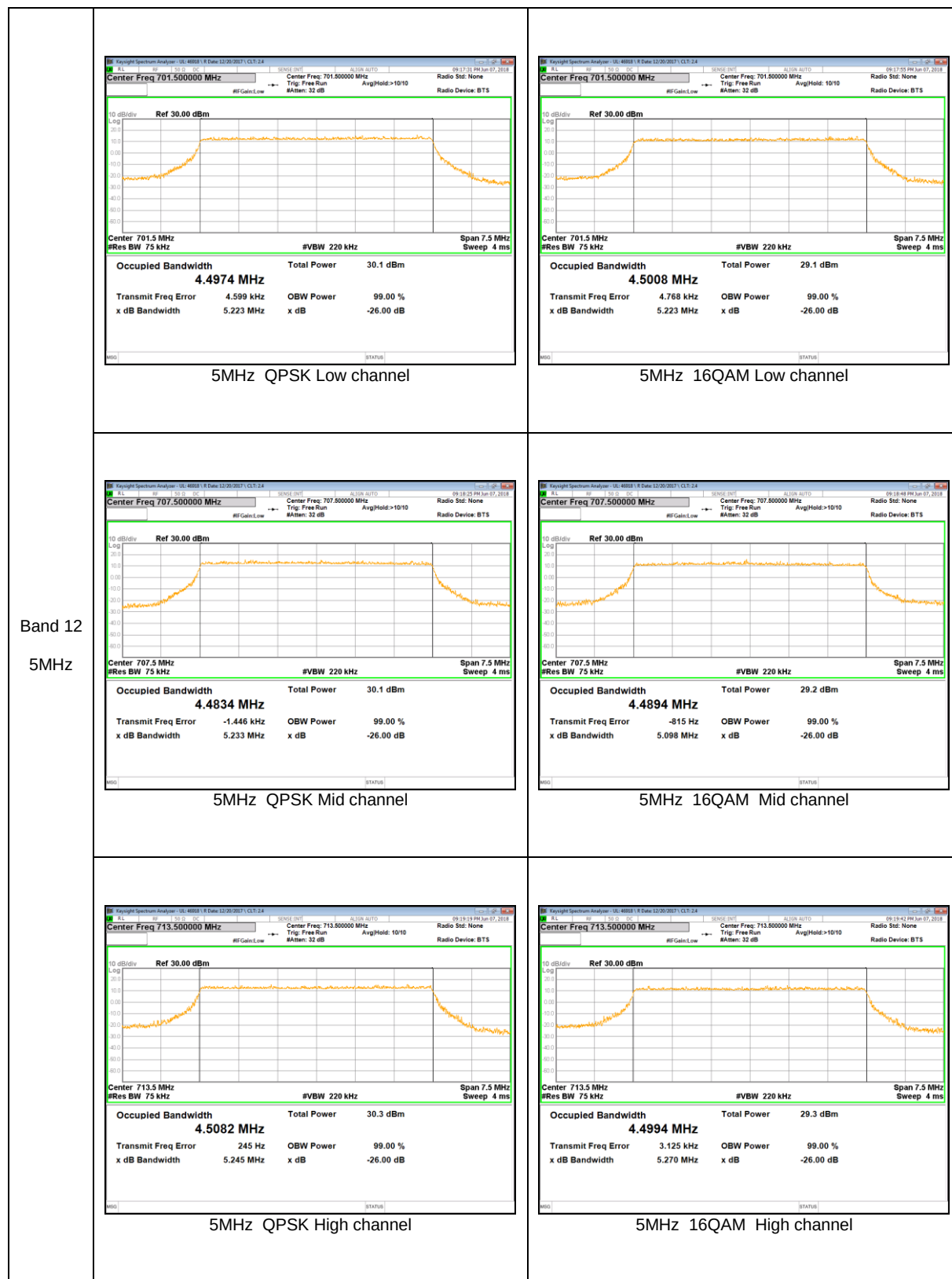


WCDMA Band 2



LTE Band 12









LTE Band 13

